REMARKS - General

By the above amendment, applicant has currently amended the specification, the abstract, and all of the claims to define the invention more particularly and distinctly so as to overcome the technical objections and rejections and define the invention patentably over the prior art reference.

The Rejection of Claims 1–5, 9-11, and 18-20 on Huang, et al. (US patent application 2003/0053521) Under 35 USC 102(e) Are Overcome.

The office action rejected the independent claim 1 and the dependent claim 2-5 and 9; the independent claim 10 and the dependent claim 11; and the independent claim 18 and the dependent claim 19-20 over the patent application of Huang, et al.

The independent claim 1 and the dependent claims 2-5, 9, and the independent claim 10 and the dependent claim 11, and the independent claim 18 and the dependent claim 19-20 are currently amended.

The amended claims 1-5, 9-11, and 18-20 are to emphasize the novelty of the invention and to define patentably over the prior-art reference thereof. Applicant requests reconsideration of these rejections, as now applicable to the amended independent claim 1 and the corresponding amended dependent claims 2-5 and 9, the amended independent claim 10 and the corresponding amended dependent claim 11, and the amended independent claim 18 and the corresponding amended dependent claim 19-20 for the following reasons:

(1) There is no justification in Huang, et al. separate from applicant's disclosure, which suggests that the reference be a way in the manner proposed.

(2) Even if Huang's patent application was in the manner proposed, Hunag's patent application would not show all the novel physical features of the currently amended claims 1-5, 9-11, and 18-20.

(3) These novel physical features of the amended claims 1-5, 9-11, and 18-20 produce new and unexpected results in such a way that proposed multiband UWB communications completely operates in the different methods and deals

with the different UWB signals in the different situations that Huang, et al. suggested, and therefore is novelty, unobvious and patentable over the prior-art reference.

The References And Differences Of The Present Invention Thereover

Prior to discussing the claims and the above three points, applicant will first discuss the prior-art reference and the general novelty of the present invention and its unobviousness over the prior-art reference.

Present Invention – The present invention uses a multiband with a multicarrier solution to form 11 multichannels along with novel architectures for a multiband UWB communication transceiver. The multiband UWB communication transceiver is able to transmit a data rate of 650 Msps per each multichannel with a frequency bandwidth of 650 MHz. The multiband UWB communication transceiver transmits a sequence of ultra-short shaped pulses on all of the channels at the same time. Spectrums of the ultra-short shaped pulses meet FCC requirements of emission limitation for the indoor or outdoor operations. The present invention of the multiband UWB communication transceiver can transmit a total of data rate up to 7.15 Gsps, and is programmable controlled in a flexibility way to transmit data rate with scalability. In addition, the multiband UWB communication transceiver using the ultra-short shaped pulses is able to penetrate objects, such as walls in a room, and has capabilities of anti-jamming, anti-interference, and anti-hacking in nature. Sampling rate of A/D and D/A converters can be reduced as well because of using the multiband solution to substitute a single wideband approach. Moreover, the present invention is a single UWB communication device that can deal with a dual-mode indoor and/or outdoor operation, thereby leading to save cost for the multiband UWB communication transceiver.

Huang, et al. disclosed an electronic device for providing a multi-carrier spread spectrum signal. Huang mentioned Figure 2-7 comprising polyphase based multichannel (141), shaped pulse generator (Fig. 6, 610), switch (Fig. 6, 620), down converters (Fig. 3,

108), A/D converters and rake receiver (Fig. 3, 171), and parallel-to-serial converter (Fig. 3, 173) as well as paragraphs ([0042]-[0052], [0054]-[0059], and [0065]-[0068).

Note that Huang has a serial to parallel converter 141, which is used to convert an input signal into K output channels as shown in Fig. 4. Huang's way uses the serial to parallel converter 141 to map 15 bits into K channels, that is, 1-8 bits are mapped into the channel K-1, 9-12 bits are mapped into the channel 2, 13-14 bits are mapped into the channel 1, and 15 bit is mapped into the channel 0. Thus, it is a bit converter that converts a sequence bits into different channel with different number of bits. The present applicant's invention uses a polyphase based multichannel that converts an input signal data sequence with M data rate into L multichannels, each multichannel only has M/L data rate. In addition, the polyphase-based multichannel converts the input signal data sequence in such a way that interleaves the input signal data sequence into L multichannels with an equal space. The equal space contains the same number of bits, which is a frame-based polyphase approach. The length of the equal space for the polyphase-based multichannel is programmable and controlled depending on different modulations used. Therefore, it is clear that there are fundamental difference between the applicant's invention of the polyphase based multichannels and Huang's serial to parallel converter 141.

In a similar way, Huang uses a parallel to serial converter (Fig. 3, 173) that is also completely different from what the present applicant's polyphase based demultichannel approach does.

Note that Huang uses a shaped pulse generator (Fig. 6, 610), which is a code sequence store. The code sequence store has several coded sequence with P bits. It is clear that each coded sequence is PN sequence, which is a CDMA approach, to spread an input signal. Thus, this is not shaped pulse generator as the present applicant uses. It is also clear that Huang's code sequence store, which produces each coded sequence, will not meet FCC indoor and outdoor emission limitations for the UWB operation. In other words, Huang's method does not design to meet FCC requirements for UWB operations. The applicant's invention uses a shaped pulse generator that is able to produce M different digital ultra-shaped monocycle pulses. Each spectrum of the ultra-shaped

monocycle pulse not only exactly meets FCC indoor and outdoor emission limitation but also approaches into correct multiband locations for the UWB operation. Therefore, the applicant's invention of the shaped pulse generator is completely different from what Huang's method of the code sequence store.

Note that Huang's switch (Fig. 6, 620) is used to connect the code sequence store to a multiplier, which is coupled to a row-in column-out memory array. The applicant's invention has two type switches. One type switch is used in polyphase-based multichannel and demultichannel. This switch is operated at uniform speed either rotating at clock-direction or rotating at counter-clock-direction. Another type switch is used in the shaped pulse generator. The switch is used to select a type of shaped pulses for transmitting. Therefore, it is clear that the applicant's switches are different from what Huang's switch does.

Note that Huang's down converters (Fig. 3, 108) are I and Q demodulations, which produce real and imaginary signals. The applicant's invention of the multichannel-based multicarrier down converter is used to map multichannel RF ultra-short shaped pulses into baseband shaped pulses. Thus, the applicant's multichannel-based multicarrier down converter is different from what Huang's down converters for I and Q demodulations do.

Note that Huang's rake receiver (Fig. 3, 171), which is a sequence dispreading. The sequence dispreading is used to dispread a spreaded sequence. As can be seen, the sequence dispreading is not a rake receiver that performs an autocorrelation. The applicant's invention of the rake receiver is used to perform the autocorrelation between received ultra-short shaped pulse and template ultra-short shaped pulse that generated from the shaped pulse generator. Therefore, it is clear that the applicant's rake receiver is completely different from what Huang's method of the sequence dispreading does.

Further note that the applicant's polyphase-based multichannel and demultichannel, shaped pulse generator, switch, multichannel-based multicarrier down converter, A/D converters, and rake receiver are integrated with novel multiband UWB transmitter and receiver architectures that are especially designed to meet FCC emission limitation for the indoor and/or outdoor UWB applications. Therefore, it is clear that the

applicant's multiband UWB communication transceiver for the indoor and/or outdoor UWB operation is completely different from what Huang's electronic device for providing the multi-carrier spread spectrum signal does.

In summary, **Huang, et al.**, is an art that presented the electronic device for providing the multi-carrier spread spectrum signal. The applicant's invention is the multiband UWB communication transceiver for the indoor and/or outdoor UWB communications. The applicant's invention is a single UWB communication device that enables to transmit a very-high data rate up to 7.15 Gsps, with scalability and programmability for the indoor and/or outdoor UWB operation. Therefore, the application's invention using the polyphase-based multichannel and demultichannel, shaped pulse generator, switch, multichannel-based multicarrier down converter, A/D converters and rake receiver along with novel transceiver architecture is fundamentally different from Huang's method thereof. As a result, it is impossible and unobvious to one having ordinary skill in the art to develop the multiband UWB communication transceiver for the indoor and/or outdoor UWB operations even given Huang's prior-art reference.

Huang, et al. Does Not Contain Any Justification To Support Individual Form, Much Less In The Manner Proposed

With regard to Huang's invention, it has been shown that there are fundamentally differences between the applicant's invention and Huang's invention as the applicant discussed above. Therefore, it is invalid to use the prior-art reference to reject the applicant's invention under 35 U.S.C. 102(e).

The fact that the prior-art reference based on Huang's invention is not sufficient to gratuitously and selectively substitute parts of one reference for a part of another reference in order to meet the applicant's novel claims because there are fundamental differences between the applicant's invention of the multiband UWB communication transceiver and Huang's electronic device for providing spread spectrum signal approach. Thus, the applicant submits the fact that the multiband UWB communication transceiver

produces advantages militates in favor of the applicant because it proves that the applicant's invention produces new and unexpected results and hence is unobvious.

Therefore, the applicant submits that Huang's invention is not legally justified and is therefore improper. Thus, the applicant submits that the rejection on the prior-art reference is also improper and should be withdrawn.

Even If Huang's Invention Was In The Manner Proposed, Huang's invention Would Not Show All The Novel Physical Feature Of The Currently Amended Claims 1, 10, and 18.

However, even if Huang's invention was legally justified, the claims 1, 10 and 18 would still have novel and unobvious physical features over the proposed form. In other words, the applicant's invention, as defined by the currently amended claims 1, 10 and 18, comprises much more than merely substitutes a plurality of templates to one template. Furthermore, there are fundamentally differences between the applicant's invention of the physical feature structure and expected results and Huang's invention. It is also clear that the applicant's invention has novel and unobvious physical features over the prior-art reference.

Thus, the applicant submits that the present invention of the multiband UWB communications is much more than merely substituting a plurality of templates for one template and that the amended claims 1, 10, and 18 clearly recite novel physical subject matter, which distinguishes over Huang's invention.

The Novel Physical Features Of the Claims 1, 10, and 18 Produce New And Unexpected Results And Hence Are Unobvious And Patentable Over The Reference

The applicant also submits that the novel physical features of the amended claims 1, 10, and 18 are unobvious and hence patentable since it produces new and unexpected results over Huang's invention thereof.

These new and unexpected results are the ability of the applicant's invention of the multiband UWB communications to transmit UWB signals at a very-high data rate up to 7.15 Gsps, with scalability and programmability in the outdoor and outdoor UWB

operations, thereby achieving a single multiband UWB communication device for dual-mode indoor and outdoor UWB operations.

Therefore, the applicant's invention of the multiband UWB communications is novel and vastly superior to that of Hunag's invention thereof. The novel physical features of the applicant's invention of the multiband UWB communications that affects these differences are, as stated, clearly recited in the amended claims 1, 10, and 18.

The Dependent Claims Are A Fortiori Patentable Over Huang's invention

The amended claims 2-9, 11-17, and 19-20 incorporate all the subject matter of the amended independent claims 1, 10, and 18 and add additional subject matter that makes them a fortiori and independently patentable over the prior-art reference. Accordingly, the applicant submits that the amended dependent claims 2-9, 11-17, and 19-20 are a fortiori patentable and should also be allowed.

Conclusion

For all the reasons given above, the applicant respectfully submits that the abstract, specification, and amended claims are new in proper form, and that the amended claims all define patentable over the prior-art reference. Therefore, the applicant submits that this application is now in full condition for allowance, which action applicant respectfully solicits.

Conditional Request For Constructive Assistance

The applicant has amended the abstract, specification and all of the claims of the patent application so that they are proper, definite, and define novel physical feature structures, which are also unobvious. Therefore, this application is submitted that patentable subject matter is clearly present. If, for any reason this application is not believed to be in full condition for allowance, the applicant respectfully requests the constructive assistance and suggestions of Examiner pursuant to M.P.E.P. Section 2173.02 and Section 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,

George J. Miao, Ph.D.

---------- Applicant Pro Se ----------

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Date: February 12, 2007

Inventor's Signature: